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(54) **MESSAGE DELIVERY BASED UPON GEOGRAPHICAL AND TEMPORAL PARAMETERS**

(75) Inventor: **KEVIN ILCISIN**, BEAVERTON, OR (US)

Correspondence Address:
MARTIN C FLIESLER
FLIESLER DUBB MEYER & LOVEJOY LP
FOUR EMBARCADERO CENTER SUITE 400
SAN FRANCISCO, CA 941114156

(73) Assignee: **TECHNICAL VISIONS, INC.**

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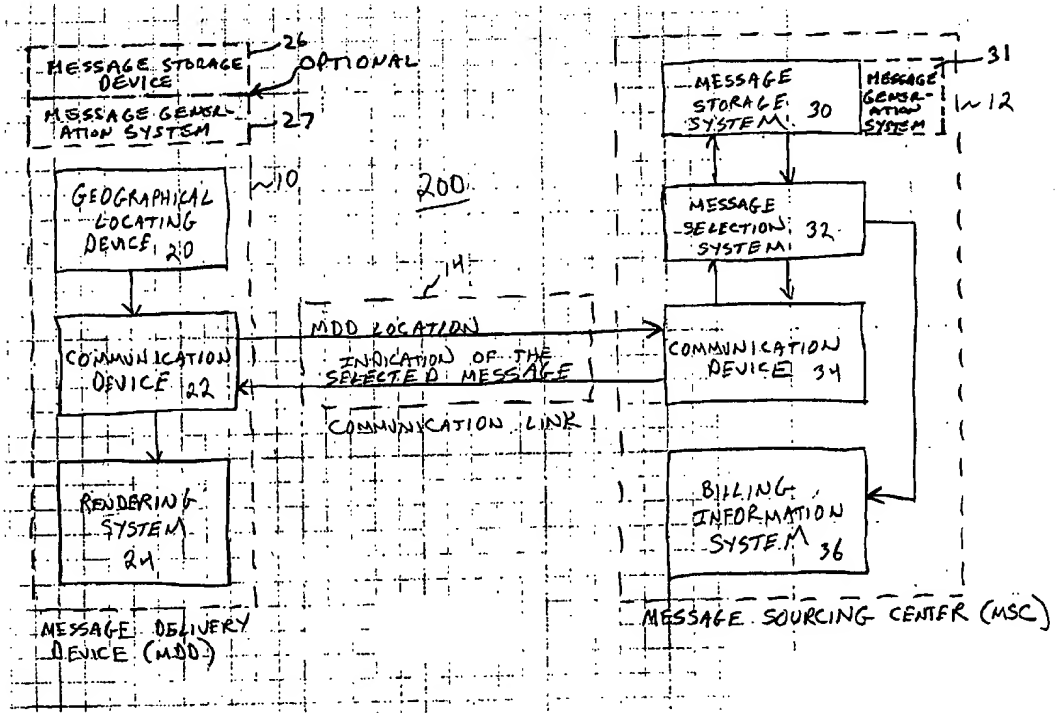
(57) **ABSTRACT**

A message system includes a message delivery device having a rendering device and a locating device for determining an indication of geographical location of the display. The message system also includes a capability for selecting or generating a message for the display from among a set of predefined or generated messages in response to the indication of geographical location and a timing parameter.



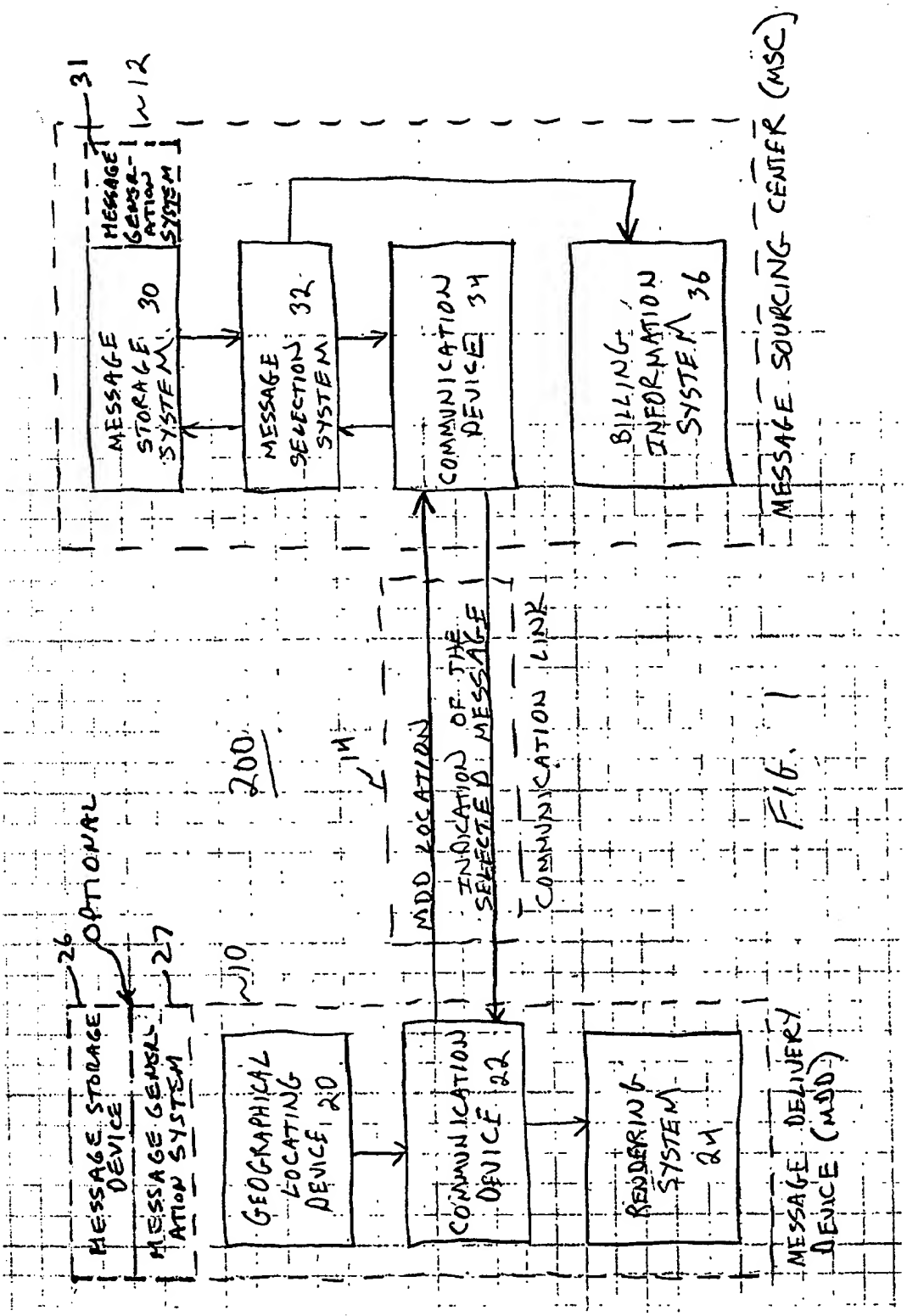

MESSAGE SOURCING CENTER (MSC)
MESSAGE GENERATION SYSTEM
31
12
MESSAGE STORAGE SYSTEM 30
MESSAGE SELECTION SYSTEM 32
COMMUNICATION DEVICE 34
BILLING INFORMATION SYSTEM 36
200
14
MDD LOCATION INDICATION OF THE SELECTED MESSAGE
COMMUNICATION LINK
MESSAGE STORAGE DEVICE
OPTIONAL
26
MESSAGE GENERATION SYSTEM
27
10
GEOGRAPHICAL LOCATING DEVICE 20
COMMUNICATION DEVICE 22
RENDERING SYSTEM 24
MESSAGE DELIVERY DEVICE (MDD)

FIG. 1

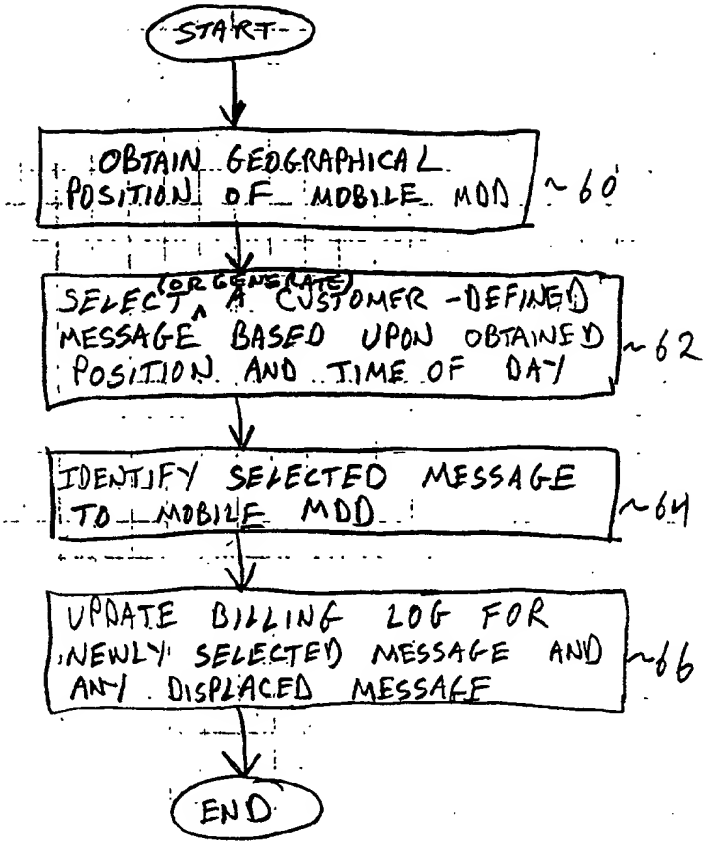

START
OBTAIN GEOGRAPHICAL POSITION OF MOBILE MDD
60
SELECT (OR GENERATE) A CUSTOMER-DEFINED MESSAGE BASED UPON OBTAINED POSITION AND TIME OF DAY
62
IDENTIFY SELECTED MESSAGE TO MOBILE MDD
64
UPDATE BILLING LOG FOR (NEWLY) SELECTED MESSAGE AND ANY DISPLACED MESSAGE
66
END

FIG. 2

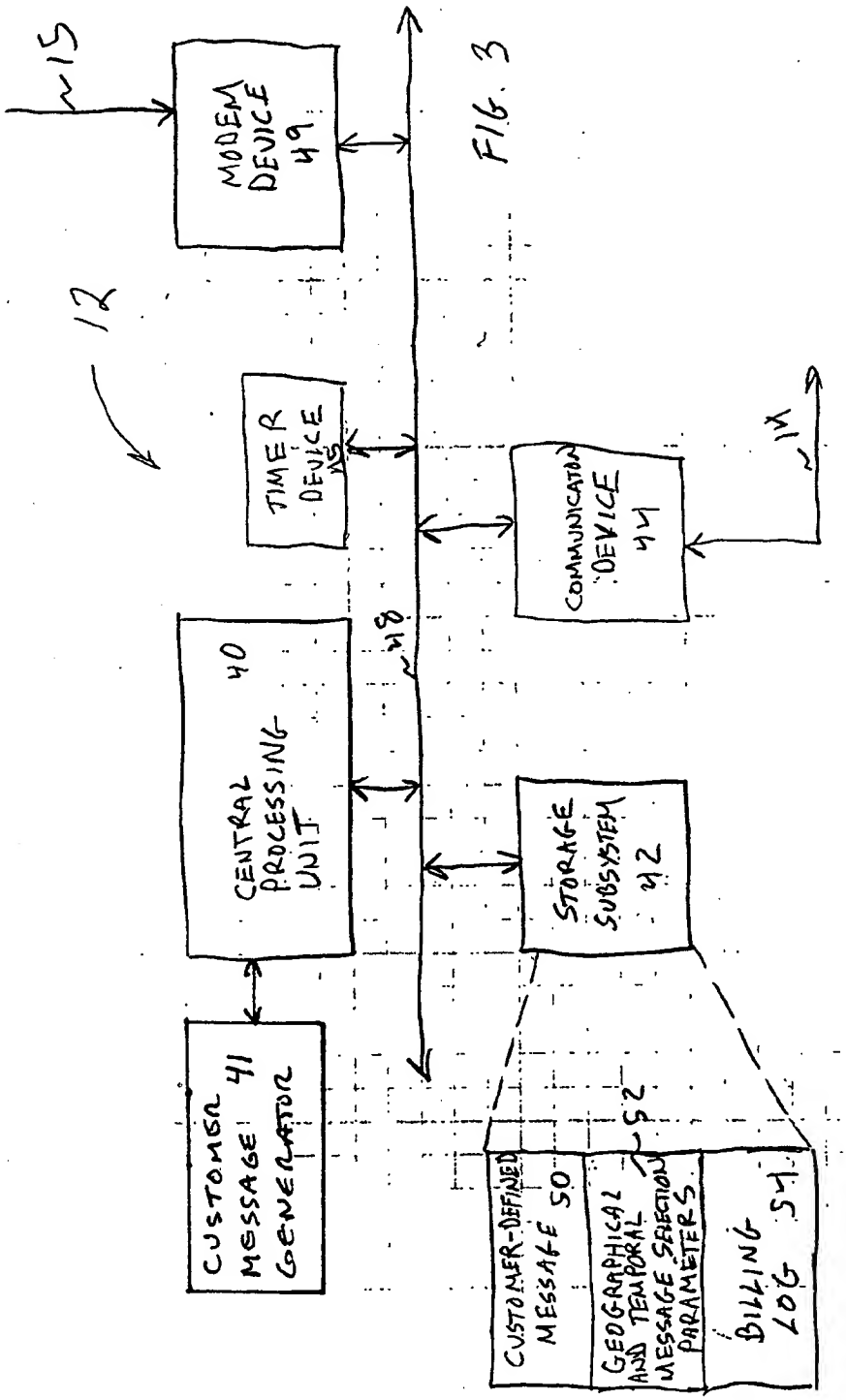

15
MODEM DEVICE 49
12
TIMER DEVICE 45
COMMUNICATION DEVICE 44
18
CENTRAL PROCESSING UNIT 40
STORAGE SUBSYSTEM 42
CUSTOMER MESSAGE GENERATOR 41
CUSTOMER-DEFINED MESSAGE 50
GEOGRAPHICAL AND TEMPORAL MESSAGE SELECTION PARAMETERS 52
BILLING LOG 54

FIG. 3

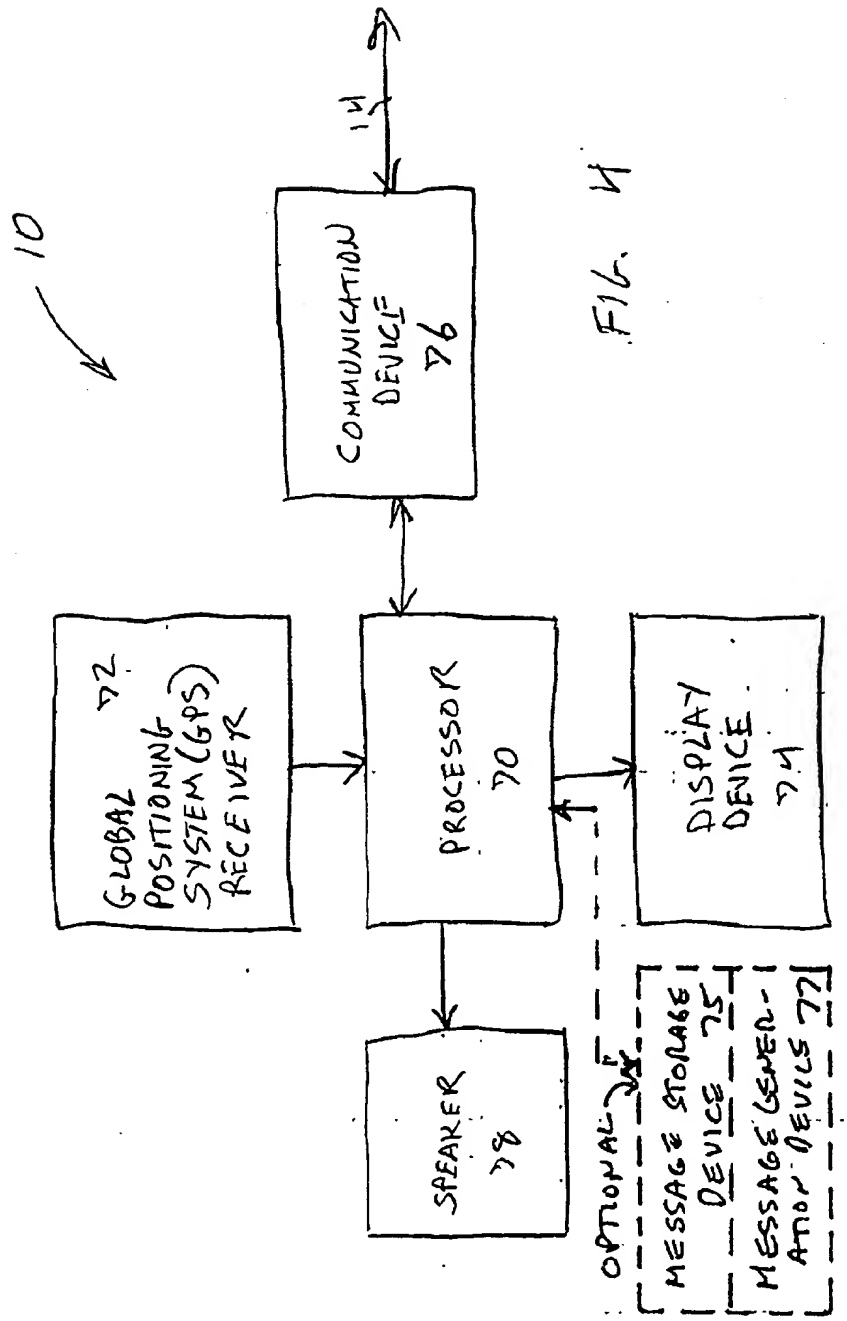
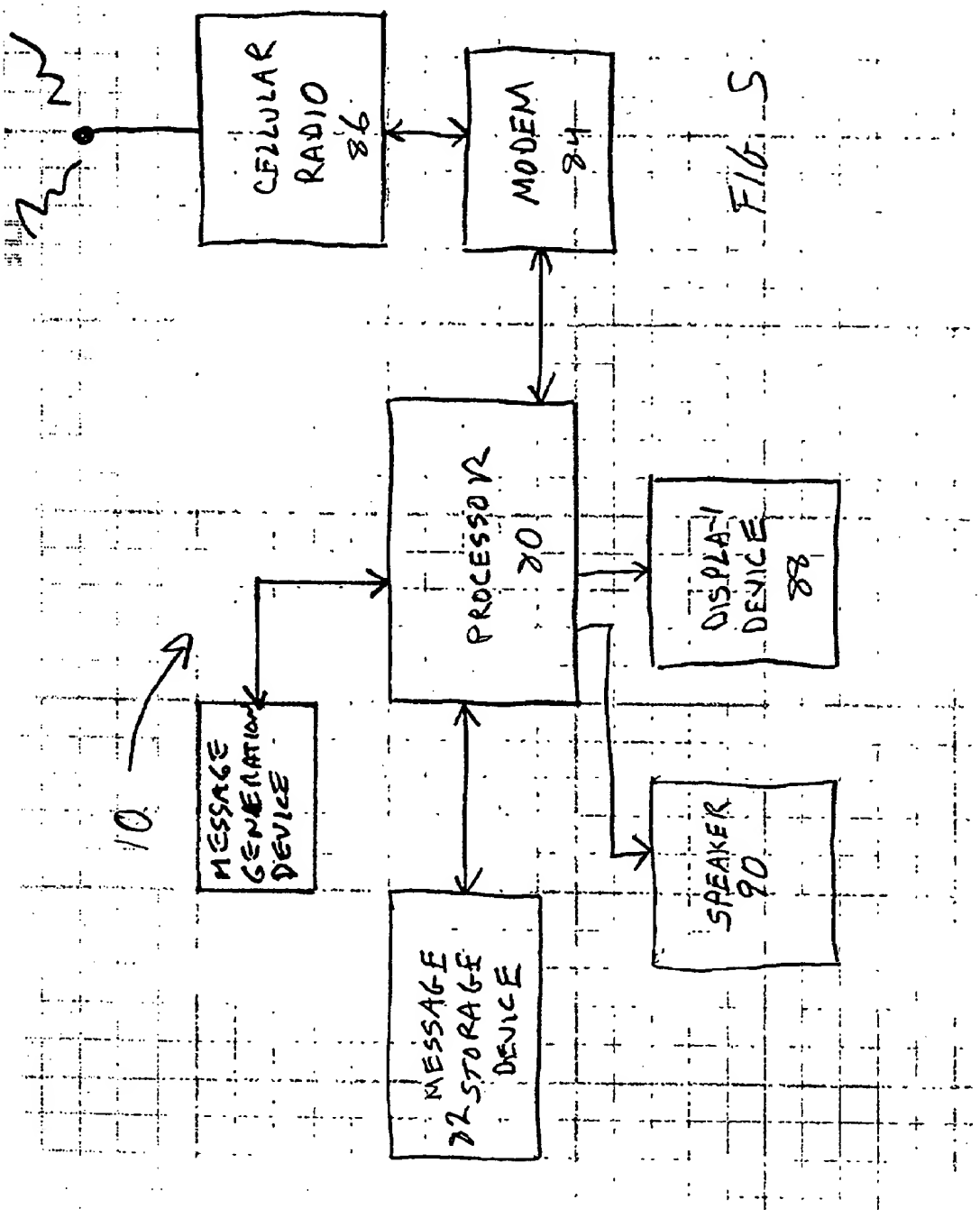

10
14
COMMUNICATION DEVICE 76
GLOBAL POSITIONING SYSTEM (GPS) RECEIVER 72
PROCESSOR 70
DISPLAY DEVICE 74
SPEAKER 78
OPTIONAL
MESSAGE STORAGE DEVICE 75
MESSAGE GENERATION DEVICE 77

FIG. 4


CELLULAR RADIO 86
MODEM 84
PROCESSOR 80
DISPLAY DEVICE 88
SPEAKER 90
MESSAGE STORAGE DEVICE 82
MESSAGE GENERATION DEVICE
10
FIG. 5

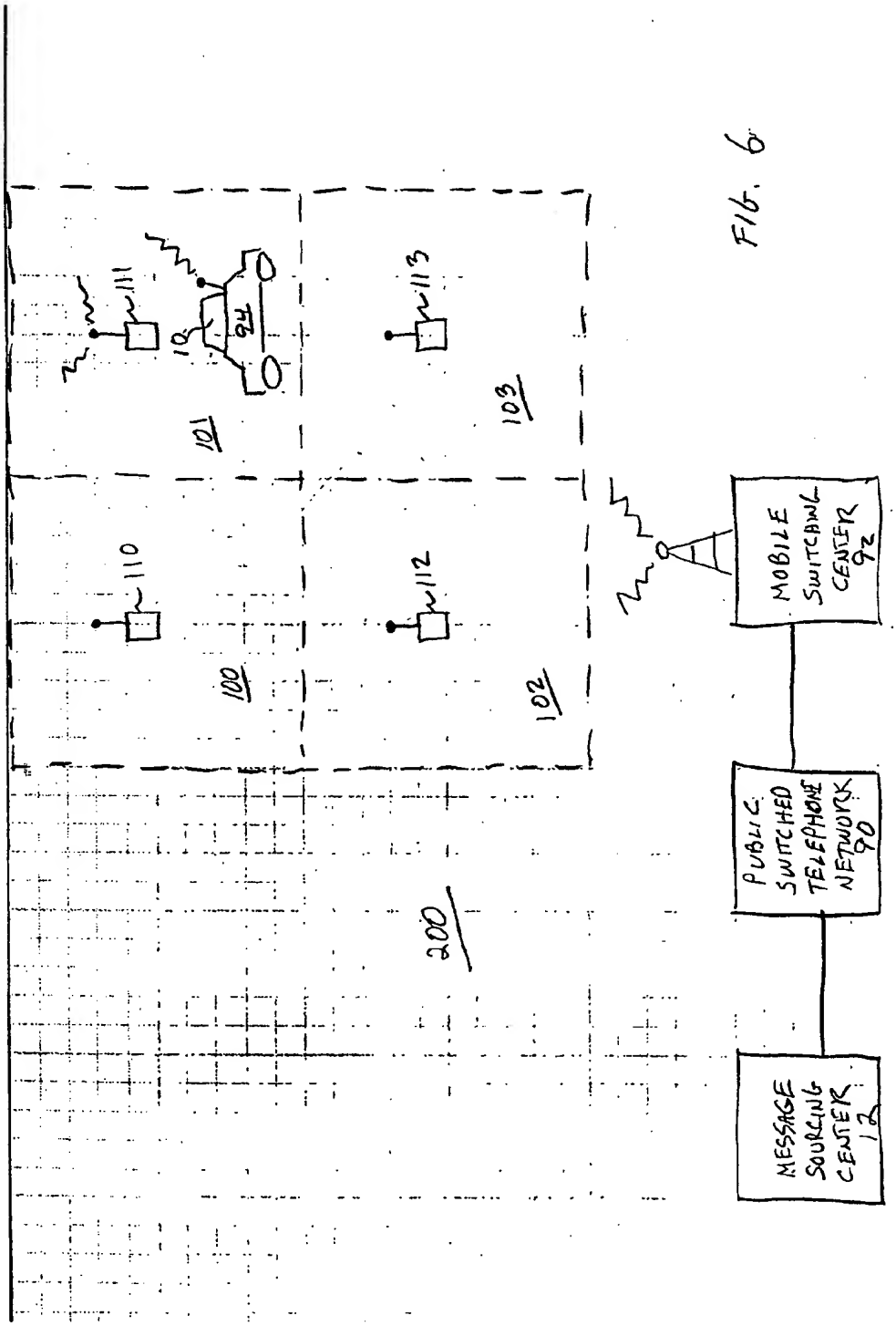

111
18
24
113
103
101
110
112
100
102
200
MOBILE SWITCHING CENTER 92
PUBLIC SWITCHED TELEPHONE NETWORK 90
MESSAGE SOURCING CENTER 12

FIG. 6

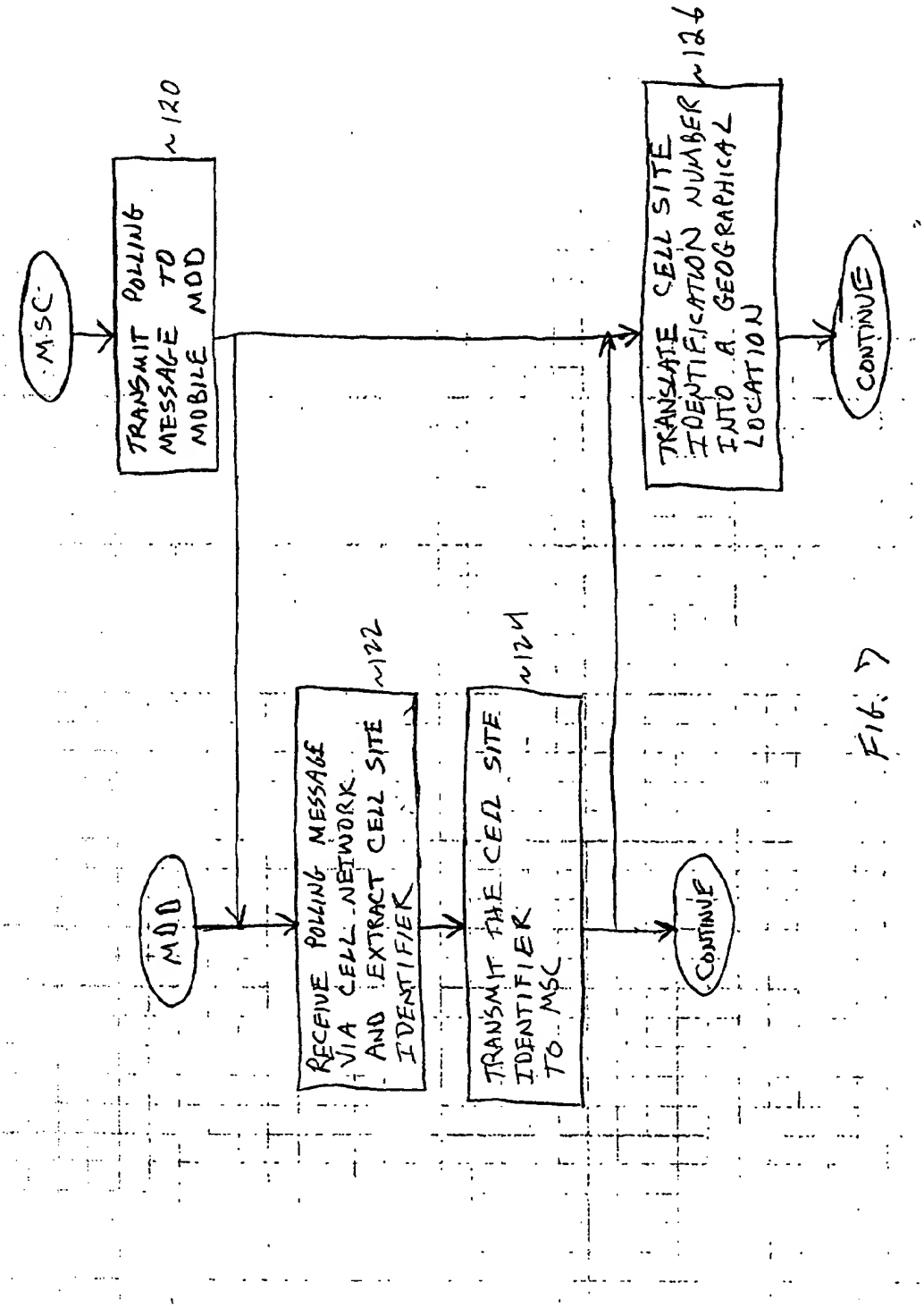

MSC
TRANSMIT POLLING MESSAGE TO MOBILE MOD
120
TRANSLATE CELL SITE IDENTIFICATION NUMBER INTO A GEOGRAPHICAL LOCATION
126
CONTINUE
MOD
RECEIVE POLLING MESSAGE VIA CELL NETWORK AND EXTRACT CELL SITE IDENTIFIER
122
TRANSMIT THE CELL SITE IDENTIFIER TO MSC
124
CONTINUE

FIG. 7

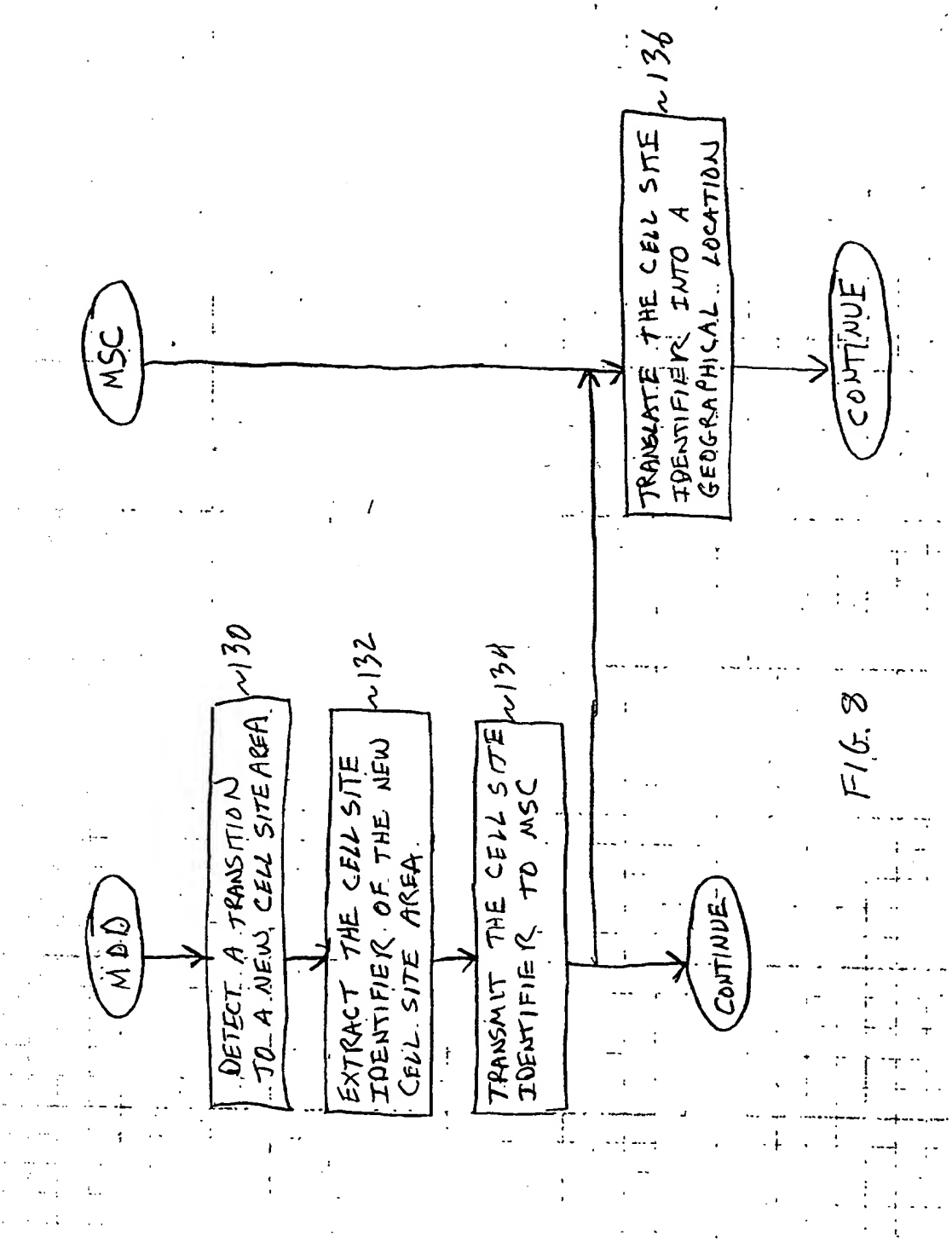

MSC
MDD
DETECT A TRANSITION TO A NEW CELL SITE AREA
130
EXTRACT THE CELL SITE IDENTIFIER OF THE NEW CELL SITE AREA
132
TRANSMIT THE CELL SITE IDENTIFIER TO MSC
134
TRANSLATE THE CELL SITE IDENTIFIER INTO A GEOGRAPHICAL LOCATION
136
CONTINUE
CONTINUE

FIG. 8

MESSAGE DELIVERY BASED UPON GEOGRAPHICAL AND TEMPORAL PARAMETERS

BACKGROUND OF THE INVENTION

[0001] 1. Field of Invention

[0002] The present invention pertains to the field of message delivery systems. More particularly, this invention relates to a system that delivers messages based upon geographical and temporal parameters.

[0003] 2. Art Background

[0004] Entities such as corporations, public organizations, or individuals commonly seek to deliver particular messages to a relatively large audience of people. Prior techniques for delivering messages to a large audience include broadcast media advertising on television and radio. Other prior techniques include newspapers, fixed location and content displays such as billboards, and fixed content mobile displays attached to vehicles such as taxicab vehicles or urban transport buses.

[0005] In addition, recent increases in the cost of broadcast advertising as well as newspaper advertising have created a demand for message delivery techniques that are able to reach specialized audiences. As a consequence, it would be desirable to employ mobile delivery systems such as signs or speakers attached to buses or taxicabs to conduct messages to specialized audiences such as individuals located in particular areas of a city.

[0006] The effectiveness of a mobile message targeted for such specialized audiences typically depends upon both geographical and temporal parameters. For example, a mobile advertising sign attached to a bus or taxicab is more effective for reaching an intended audience if displayed during peak commuting time intervals and in an appropriate geographical area targeted by the particular message.

[0007] Unfortunately, existing mobile message displays usually do not account for such geographical and temporal parameters. Taxicabs, for example, can roam over a wide area and thus could be rendered ineffective for displaying advertisements targeted for a particular neighborhood. City buses usually offer similar uncertainties in time and location of display. Moreover, such uncertainties in the actual geographical and temporal parameters associated with a particular message usually complicates the task of assessing the value of such advertising and results in imprecise customer billing for such mobile message displays.

SUMMARY AND OBJECTS OF THE INVENTION

[0008] One object of the present invention is to provide a system with message delivery based upon geographical and temporal parameters.

[0009] Another object of the present invention is to provide a basis for accounting and billing that includes actual geographical and temporal parameters associated with delivered messages.

[0010] These and other objects are provided by a message system having a message rendering device and having a locating device for determining an indication of geographical location of the message rendering device. The message system includes a capability to select a particular message for rendering from among a set of predefined messages in response to the indication of geographical location and a timing parameter.

[0011] Other objects, features and advantages of the present invention will be apparent from the detailed description that follows.

BRIEF DESCRIPTION OF THE DRAWINGS

[0012] The present invention is described with respect to particular exemplary embodiments thereof and reference is accordingly made to the drawings in which:

[0013] **FIG. 1** illustrates a message system including a message sourcing center and a mobile message delivery device and a communication link;

[0014] **FIG. 2** illustrates a message selection and delivery process that accounts for geographical and temporal parameters of the message delivery devices;

[0015] **FIG. 3** illustrates one embodiment of a message sourcing center;

[0016] **FIG. 4** illustrates one embodiment of a message delivery device that employs a global positioning system (GPS) to obtain geographic location parameters;

[0017] **FIG. 5** illustrates an embodiment of a message delivery device that employs cellular communication for geographical locating and communication;

[0018] **FIG. 6** illustrates a geographical locating function of the message system that employs a cellular telephone network for locating;

[0019] **FIG. 7** illustrates a process by which the message sourcing center obtains the geographical location of the message delivery device in an embodiment that employs a cellular telephone network as a geographical locating mechanism;

[0020] **FIG. 8** illustrates another process by which the message sourcing center obtains the geographical location in an embodiment that employs a cellular telephone network for geographical locating.

DETAILED DESCRIPTION

[0021] **FIG. 1** illustrates a message system **200** that provides message delivery based on geographical and temporal parameters. The message system **200** includes a message sourcing center (MSC) **12** and one or more mobile message delivery devices which include for purposes of illustration a message delivery device (MDD) **10**. The message sourcing center **12** communicates with the message delivery device **10** via a communication link **14**.

[0022] The message delivery device **10** includes a capability for determining its geographical location. In one embodiment, the message delivery device **10** reports its geographical location to the message sourcing center **12** by transferring messages to the message sourcing center **12** via the communication link **14**. The message sourcing center **12** in turn uses the reported geographical location of the message delivery device **10** in conjunction with time of day parameters to select [or generate] a particular customer

defined message for rendering by the message delivery device **10**. Alternatively, the message delivery device **10** internally implements logic for selecting [or generating] messages based upon its geographical location and time of day.

[**0023**] In one embodiment, the message sourcing center **12** transfers a selected [or generated] message from among customer defined messages to the message delivery device **10** via the communication link **14**. The message delivery device **10** then renders the selected [or generated] message to an audience.

[**0024**] Alternatively, the message sourcing center **12** transfers an identifier for the selected [or generated] customer defined message to the message delivery device **10** via the communication link **14**. The message delivery device **10** uses the identifier for the selected message to retrieve [or generate] the selected message from internal storage.

[**0025**] The customer defined messages may be transmitted from the message sourcing center **12** to the message delivery device **10** during off peak time periods of the communication link **14**. In addition, the customer defined messages may be stored in a persistent medium within the message delivery device **10**. In either case, the message sourcing center **12** need only transmit a relatively brief identifier rather than a full message which can lower the cost of message delivery during peak time periods of the communication link **14**.

[**0026**] In yet another embodiment, the message sourcing center **12** broadcasts customer defined messages or identifiers for the customer defined messages along with corresponding selection parameters to all message delivery devices. Each message delivery device including the message delivery device **10** stores the broadcast information and then compares the selection parameters provided by the message sourcing center **12** to its geographical location and time of day to select or generate a particular customer defined message for rendering. In this embodiment, the message delivery device **10** includes a timer device to determine the time of day.

[**0027**] The message delivery device **10** as illustrated includes a geographical locating device **20**, a communication device **22**, a rendering system **24**, and may have a message storage **26** or generation system **27** as well. The rendering system **24** provides audio and/or visual message rendering. The geographical locating device **20** determines the geographical location of the message delivery device **10**. The optional message storage or generation unit can store or generate messages without communicating with the message sourcing center **12**.

[**0028**] In one embodiment, the geographical locating device **20** determines location of the message delivery device **10** in response to paging or polling messages that originate with the message sourcing center **12**.

[**0029**] In another embodiment, the geographical locating device **20** periodically determines the geographical location of the message delivery device **10** according to a predetermined time interval.

[**0030**] In yet another embodiment, the geographical locating device **20** independently determines and reports any significant changes in geographical location of the message delivery device **10**.

[**0031**] The communication device **22** enables data communication over the communication link **14**. The communication device **22** transfers geographical location parameters to the message sourcing center **12** via the communication link **14** in some embodiments. The communication device **22** receives data containing customer defined or generated messages or message identifiers and possibly selection parameters from the message sourcing center **12** via the communication link **14** in some embodiments.

[**0032**] The rendering system **24** delivers the selected or generated customer defined messages to an audience in response to the geographical location of the message delivery device **10** and temporal parameters. For applications wherein the message delivery device **10** is attached to a moving vehicle such as a city bus or a taxicab, the rendering system **24** may be selected for characteristics such as ruggedness, low power consumption, and relatively low weight. An example of such an embodiment for the rendering system **24** is a large area light emitting diode (LED) display.

[**0033**] The rendering system **24** may also be embodied in a wide variety of commonly available displays. For example, the rendering system **24** may have the capability to render customer defined or generated static or moving images. A raster display for example with appropriate rendering processor hardware may be employed for rendering recorded or digitally encoded video images from a number of available formats.

[**0034**] It is preferable that video images containing customer defined or generated messages be stored or generated within the message delivery device **10**. In such embodiments, the message sourcing center **12** need only transmit a low bandwidth message identifier to the message delivery device **10** to provide real time video message delivery. In other embodiments, the communication link **14** must provide sufficient bandwidth to handle the transfer of digitally encoded video image files to provide real time message delivery.

[**0035**] The message sourcing center **12** includes a message storage system **30** or generation system **31**, a message selection system **32**, a communication device **34**, and a billing information system **36**. The message storage or generation system **30/31** holds a set of customer defined, customer provided, or customer generated messages for display on the rendering system **24** according to the customer defined and provided geographical and temporal parameters associated with the messages.

[**0036**] The customer defined or generated messages and selection parameters may be transmitted to the message sourcing center **12** via the communication link **14**. Alternatively, the customer defined or generated messages and selection parameters may be provided by an off-line delivery means such as removable storage or hard copy or by alternative communication lines such as telephone land lines or cellular links.

[**0037**] The message selection system **32** in one embodiment selects or generates an appropriate customer defined message for delivery to an audience via the message delivery device **10**. The message selection system **32** selects a particular stored or generated message based upon the customer provided geographical and temporal selection

parameters for the particular message and the actual geographical parameters reported by the message delivery device **10** and the time of day. In an alternative embodiment, the message selection logic of the message selection system **32** is implemented in the message delivery device **10**.

[**0038**] The communication device **34** enables the transfer of customer defined or generated messages to the message delivery device **10** via the communication link **14**. The communication device **34** also enables the transfer of identifiers for the selected customer defined or generated messages and selection parameters as well as reception of geographical locating parameters from the message delivery device **10** as required for particular embodiments.

[**0039**] The billing information system **36** stores a set of billing log parameters that enable accounting and billing functions associated with the customer defined or generated messages supported by the message sourcing center **12**. The billing information system **36** stores the geographical and temporal parameters associated with messages selected by the message selection system **32** and then rendered on message delivery devices supported by the message sourcing center **12** including the message delivery device **10**.

[**0040**] In one embodiment, the communication link **14** is a conventional and commonly available cellular telephone network. In this embodiment, the communication devices **22** and **34** provide cellular modem capabilities.

[**0041**] In another embodiment, the communication link **14** is realized with a dedicated radio frequency spectrum for communication among the message sourcing center **12** and associated message delivery devices. In this embodiment, the communication devices **22** and **34** provide radio transceiver capabilities for the dedicated spectrum along with message encoding and decoding capabilities.

[**0042**] In another embodiment, the communication link **14** is provided by existing satellite communication links. In this embodiment, the communication devices **22** and **34** provide suitable uplink and downlink communication capabilities for the particular satellite system employed with the message system **200**.

[**0043**] In another embodiment, the communication link represents the transfer through a physical means, such as a temporary cable or link, or the physical transfer of a removable storage device which contains messages, identifiers or billing information.

[**0044**] **FIG. 2** illustrates a message selection or generation and display process undertaken within the message system **200**. At block **60**, the message sourcing center **12** obtains the geographical position of the message delivery device **10**.

[**0045**] In one embodiment, the message sourcing center **12** obtains the geographical position of the message delivery device **10** at block **60** by transmitting a polling message via the communication link **14**. The message delivery device **10** determines its current geographical position in response to the polling message from the message sourcing center **12**. The message delivery device **10** then transmits its current geographical location back to the message sourcing center **12**.

[**0046**] In another embodiment, the message delivery device **10** periodically determines its location and reports its location to the message sourcing center **12** via the communication link **14** at block **60**. In yet another embodiment, the message delivery device **10** reports a significant change in its geographical location at block **60**.

[**0047**] At block **62**, the message sourcing center **12** selects a customer-defined or generated message based upon the reported geographical location parameter of the message delivery device **10** and a time of day parameter. The message sourcing system **12** selects or generates a particular message by comparing the reported geographical and time parameters of the message delivery device **10** with customer provided geographical and time selection parameters for the particular message.

[**0048**] At block **64**, the message sourcing center **12** identifies the selected message to the message delivery device **10**. In one embodiment at block **64**, the message sourcing center **12** transmits the selected customer defined or generated message to the message delivery device **10** via the communication link **14**. In another embodiment at block **64**, the message sourcing center **12** determines a message identifier for the selected customer defined or generated message and transmits the message identifier to the message delivery device **10** via the communication link **10**.

[**0049**] At block **66**, the message sourcing center **12** updates the billing information system **36** with the geographical and temporal parameters for the newly selected message displayed on the message delivery device **10**. In addition, the billing information system **36** updates the billing log parameters associated with the message displaced from the message delivery device **10** by the newly selected message.

[**0050**] **FIG. 3** illustrates one embodiment of the message sourcing center **12**. The message sourcing center in this embodiment includes a central processing unit **40**, a storage subsystem **42**, a communication device **44** a timer device **45**, and a modem device **49**.

[**0051**] The central processing unit **40** executes a set of software that performs the message selection functions and the geographical and temporal parameter logging described above. In one embodiment, the central processing unit **40** implements a timer function in conjunction with the timer device **45** to determine time of day parameters for message selection and billing information logging. The timer device function may in some embodiments be incorporated with the central processing unit **40**.

[**0052**] The central processing unit **40** transfers information via the communication link **14** through a communication device **44**. In one embodiment, the communication device **44** is a cellular modem.

[**0053**] In another embodiment, the communication device **44** is a conventional modem that connects to landline based communication links which in turn are connected to a cellular telephone network for ultimate access to the message delivery device **10**.

[**0054**] In yet another embodiment, the communication device **44** comprises a dedicated radio transceiver with a frequency spectrum allocated for communication within the message system **200**. In another embodiment, the communication device **44** comprises satellite uplink and downlink circuitry for communication via a satellite system (not shown).

[0055] The storage subsystem **42** accommodates a set of customer-defined messages for delivery by one or more message delivery devices. The storage subsystem **42** also includes the customer defined geographical and time selection parameters for message selection by the message selection software executed by the central processing unit **40**. In one embodiment, the customer defined messages and selection parameters are received via a telephone line **15** through a modem device **49**. In addition, the storage subsystem **42** accommodates a billing log that indicates actual times and locations of message display for each of the customer defined messages.

[0056] In the example shown, the storage subsystem **42** contains a customer-defined message **50** along with its corresponding geographical and temporal message selection parameters **52** and a corresponding billing log **54**. The storage subsystem **42** accommodates similar information for each of the customer defined messages of the message display system **200**.

[0057] In some embodiments, there is also implemented a customer message generator. This device may be implemented as a software routine in the central processing unit **40**, or as a separate hardware and software device that communicates with the central processing unit **40**. Such a device allows for changes or improvements to the customer defined message. For example, a customer defined message **50** located in the storage subsystem **42**, could be combined with time of day information so that the rendered message would be a combination of stored and generated information.

[0058] **FIG. 4** illustrates one embodiment of the message delivery device **10**. In this embodiment, the message delivery device **10** includes a processor **70**, a global positioning system (GPS) receiver **72**, a display device **74** and/or a speaker **78**, a communication device **76**, and may optionally include a message storage device **75** and/or a message generation device **77**. In some embodiments, the processor implements a timing function. In other embodiments, timing may be provided by a timer device (not shown) within the message delivery device **10**. The communication device **76** provides communication link functions and the GPS receiver **72** provides geographical locating functions.

[0059] The processor **70** receives polling messages from the message sourcing center **12** via the communication device **76** and the communication link **14**. The processor **70** obtains geographical location parameters from the GPS receiver **72** in response to a polling message and then reports the geographical location parameters to the message sourcing center **12** via the communication link **14**. Once the message sourcing center selects a customer defined or generated message, the processor **70** renders the selected message onto the display device **74** or through the speaker **78** or both.

[0060] The GPS receiver **72** receives and processes signals generated by the GPS satellite system. The GPS satellite system (not shown) provides satellite signals for global position determination. The GPS system is part of a satellite-based navigation system developed by the United States Defense Department. The GPS system includes a set of satellites dispersed around circular orbits. The orbits have radii of 26,560 kilometers and are approximately circular. Theoretically, three or more GPS satellites are visible from most points on the surface of the earth. As a consequence, a line of site access between the GPS receiver **72** and three or more of the GPS satellites enables determination of the geographical position of the message delivery device **10**.

[0061] Each GPS satellite carries a clock to provide timing information for the signals transmitted by the satellites. Each GPS satellite transmits two L-band carrier signals, L1 and L2, which are integral multiples of a base frequency. The L1 and L2 signals from each satellite are binary phase shift key (BPSK) modulated by predetermined pseudo random noise (PRN) codes that are different for each of the GPS satellites deployed.

[0062] The PRN codes from multiple GPS satellite signals enables the GPS receiver **72** to determine the geographical position of the message delivery device **10**. The GPS receiver **72** selects a particular GPS signal transmitted by a particular GPS satellite by generating and matching or correlating the PRN code for that particular satellite. All PRN codes are known and are stored in the GPS receiver **72**.

[0063] The GPS satellite bit stream includes information on the ephemeris of each GPS satellite, parameters identifying the particular GPS satellite, and corrections for ionospheric signal propagation delays. A discussion of the GPS system and techniques for obtaining position information from the satellite signals is found in *Guide to GPS Positioning,* edited by David Wells, Canadian GPS Associates, 1986.

[0064] In another embodiment, where the optional message storage or generation device is located within the message delivery device **10**, the message delivery device can, in response to polling requests or predetermined time or location change information, select or generate a message for rendering on the display device **74** without communicating with the message sourcing center. At a later time, the message delivery device can transfer, via the communication device **76** and over the communication link **14**, information relevant to billing to the message sourcing center.

[0065] **FIG. 5** illustrates another embodiment of the message delivery device **10**. In this embodiment, the communication functions are realized by a modem **84** in conjunction with a cellular radio **86**. In addition, the cellular radio **86** in the context of a cellular telephone network provides both the function of the communication link **14** and the geographical locating device **20**.

[0066] Also included in this embodiment of the message delivery device **10** is a message storage device **82** and/or a message generation device **83**. The message storage device **82** enables storage of a set of customer-defined messages for display on a display device **88** or for playback through a speaker **90**. The message generation device **83** enables generation of customer messages including combinations of stored and generated messages. The message generation device **83** may be incorporated into the processor **80**. The message sourcing center **12** in one embodiment transfers the set of customer-defined messages to the message delivery device **10** during off-peak and relatively low cost time intervals on the cellular network. Thereafter, the message sourcing center **12** transmits a message identifier rather than a particular selected message to the message delivery device **10** to specify particular messages. A processor **80** uses the message identifier to retrieve the selected message from the

message storage device **82** or to generate the selected message with the generation device **83** and then renders the message on the display device **88**.

[0067] **FIG. 6** illustrates the message system **200** including a cellular telephone network that provides geographical locating functions. A cellular telephone network is illustrated in simplified form having a set of cell site areas **100-103**. Each cell site area **100-103** is depicted for simplicity as a rectangular area with well-defined boundaries between adjacent cell site areas.

[0068] The cellular telephone network includes a mobile switching center **92** and a set of cell site base stations **110-113** that enable communication among cellular telephone devices located within the cell site areas **100-103**. Each of the cell site base stations **110-113** performs paging functions for locating and communicating with individual cellular telephones within the corresponding cell site area. In this example, a taxicab **94** is shown with the message delivery device **10** attached thereto including the cellular radio **86** described above. The taxicab **94** is shown located within the cell site area **101**.

[0069] The mobile switching center **92** in conjunction with the cell site base stations **110-113** provide functions for locating and tracking and handing off individual cellular telephones that traverse across the cell site areas **100-103**. The message system **200** employs these cellular telephone network mechanisms to determine the geographical location of the message delivery device **10** as the taxicab **94** moves among the cell site areas **100-103**.

[0070] In one embodiment, the message sourcing center **12** communicates with the mobile switching center **92** through a public switched telephone network **90**. In another embodiment, the message sourcing center **12** transmits directly to the mobile switching center **92** through the cellular network maintained by the mobile switching center **92**.

[0071] Each of the cell site base stations **110-113** transmits a unique cell site identifier to the cellular telephone receivers contained within the corresponding cell site area during paging operations. The message delivery device **10** extracts the unique cell site identifier and transmits the cell site identifier to the message sourcing center **12** as an indication of the geographical location of the taxicab **94**.

[0072] The message sourcing center **12** maintains a database of cell site identifiers that correlate to the geographical areas covered by the cell site areas **100-103**. The message sourcing center **12** uses the cell site identifier transmitted from the message delivery device **10** to access the cell site identifier database and determine the geographical area of the message delivery device **10**. The message selection system **10** uses the geographical area corresponding to the cell site identifier to select a particular message for display on the message delivery device **10**.

[0073] The geographical locating parameters extracted from a cellular network provide a geographical area resolution that corresponds to the physical dimensions of the individual cell site areas **100-103**. The GPS locating system described above provides finer resolution of geographical parameters in comparison to existing cellular telephone networks depending upon the sophistication of the particular GPS receiver employed.

[0074] In an alternative embodiment, the functions of the message sourcing center **12** are merged into the mobile switching center **92** that controls the cell site areas **100-103**. In this embodiment, the mobile switching center with message sourcing transmits a particular customer defined or generated message to each cell site area **100-103**. For example, a particular message is selected for the cell site area **101** and transmitted to all message display devices located within the cell site area **101** via the transmitter **111**.

[0075] **FIG. 7** illustrates a process by which the message sourcing center **12** obtains the geographical location of the message delivery device **10** in an embodiment that employs a cellular telephone network for geographical locating as well as communication. At block **120**, the message sourcing center **12** transmits a polling message to the message delivery device **10** attached to the taxicab **94**. The polling message is transferred through the public switch telephone network **90** or directly via cellular link and the mobile switching center **92**.

[0076] The mobile switching center **92** relays the polling message to the message delivery device **10** via the cell site base station **111**. The cell site base station **111** encapsulates the polling message in a packet that includes a cell site identifier for the cell site base station **111** and transmits the packet to the message delivery device **10**.

[0077] At block **122**, the message delivery device **10** receives the packet including the polling message from the cell site base station **111** and extracts the cell site identifier contained in the packet. At block **124**, the message delivery device **10** transmits the extracted cell site identifier to the message sourcing center **12**.

[0078] At block **126**, the message sourcing center **12** translates the extracted cell site area identifier into geographical parameters covered by the cell site area **101**. The geographical location parameters are then used by the message selection system **32** to select from among the messages stored in the message storage system **30** or generate a message using the message generation system which is also part of the storage system **30**.

[0079] **FIG. 8** illustrates another process by which the message sourcing center **12** obtains the geographical location in an embodiment that employs a cellular telephone network for geographical locating.

[0080] At block **130**, the message delivery device **10** senses a movement of the taxicab **94** to a new cell site area within the cellular network. The message delivery device **10** detects movement to a new cell site area by detecting a change in the cell site identifier received from the cell site base station that covers the geographical location of the taxicab **94**. For example, the message delivery device **10** detects a change in cell site identifiers received in paging messages from the cell site base station **111** and cell site base station **113** as the taxicab **94** moves from cell site area **101** into cell site area **103**.

[0081] At block **132**, the message delivery device **10** extracts the new cell site identifier contained in a paging message from the new cell site base station **113**. At block **134**, the message delivery device **10** transmits the extracted cell site identifier to the message sourcing center **12** via the cell site base station **113** and the mobile switching center **92** and possibly the public switch telephone network **90**.

[0082] At block **136**, the message sourcing center **12** translates the extracted cell site area identifier into geographical parameters covered by the cell site area **103**. The geographical location parameters are then used by the message selection system **32** to select from among the messages stored in the message storage system **30** or generate a message using the message generation system which is also part of the storage system **30**.

[0083] The foregoing detailed description of the present invention is provided for the purposes of illustration and is not intended to be exhaustive or to limit the invention to the precise embodiment disclosed. Accordingly, the scope of the present invention is defined by the appended claims.

What is claimed is:

1. A message system, comprising:

message rendering device;

locating device for determining an indication of geographical location of the message rendering device;

means for selecting a message for the message rendering device from among a set of predefined or generated messages in response to the indication of geographical location and a timing parameter.

2. The message system of claim 1, wherein the message rendering device comprises a device for rendering a visual message.

3. The message system claim 1, wherein the message rendering device comprises a device for rendering an audio message.

4. The message system of claim 1, wherein the means for selecting a message includes a set of selection parameters for each predefined or generated message.

5. The message system of claim 4, wherein the selection parameters include a set of geographical parameters for delivering the corresponding predefined or generated message.

6. The message system of claim 4, wherein the selection parameters include a set of timing parameters for delivering the corresponding predefined or generated message.

7. The message system of claim 1, wherein the message rendering device and the locating device are contained within a mobile message delivery device.

8. The message system of claim 7, wherein the means for selecting or generating a message for the message rendering device from among a set of predefined or generated messages comprises a processor contained in the mobile message delivery device.

9. The message system of claim 7, wherein the means for selecting or generating a message for the message rendering device from among a set of predefined or generated messages is contained in a message sourcing center separate from the mobile message delivery device.

10. The message system of claim 9, further comprising a communication link between the message sourcing center and the mobile message delivery device for transferring the indication of geographical location to the message sourcing center.

11. The message system of claim 10, wherein the message sourcing center transfers the message for the message rendering device to the mobile message delivery device via the communication link.

12. The message system of claim 10, wherein the mobile message delivery device includes a message storage device for holding one or more of the predefined messages.

13. The message system of claim 10, wherein the mobile message delivery device includes a message generation device for generating messages.

14. The message system of claim 12, wherein the message sourcing center transfers one or more of the predefined or generated messages to the mobile message delivery device via the communication link during an off-peak time on the communication link.

15. The message system of claim 14, wherein the mobile message delivery device includes a message generation device for generating messages.

16. The message system of claim 12, wherein the message sourcing center transfers an identifier corresponding to the message for the message rendering device to the mobile message delivery device via the communication link.

17. The message system of claim 16, wherein the mobile message delivery device uses the identifier to retrieve or generate the message for the message rendering device from the message storage device or message generation device.

18. The message system of claim 9, wherein the locating device comprises a global positioning satellite receiver.

19. The message system of claim 18, wherein the communication link comprises a cellular network.

20. The message system of claim 9, wherein the communication link comprises a cellular network.

21. The message system of claim 9, wherein the communication link comprises a temporary hard-wired connection or the physical transference of a removable storage system.

22. The message system of claim 18, wherein the communication link comprises a temporary hard-wired connection or the physical transference of a removable storage system.

23. The message system of claim 20, wherein the locating device comprises a cellular receiver.

24. The message system of claim 23, wherein the indication of geographical location comprises a cell site identifier received by the cellular receiver from a cell site base station that covers a geographical area that includes the mobile message delivery device.

25. The message system of claim 24, wherein the message delivery device transmits the cell site identifier to the message sourcing center in response to a polling message from the message sourcing center.

26. The message system of claim 24, wherein the message delivery device transmits the cell site identifier to the message sourcing center whenever the message delivery device moves between differing cell site areas of the cellular network.

27. The message system of claim 24, wherein the message sourcing center maintains a database for converting the cell site identifier into a geographical location for the corresponding cell site area.

28. The message system of claim 27, wherein the message sourcing center uses the geographical location for the corresponding cell site area to select or generate the message for the message rendering device.

29. The message system of claim 9, wherein the message sourcing center contains a set of selection or generation parameters for each predefined or generated message.

30. The message system of claim 29, wherein the selection or generation parameters include a set of geographical parameters for delivering the corresponding predefined or generated message.

31. The message system of claim 29, wherein the selection or generation parameters include a set of timing parameters for delivering the corresponding predefined or generated message.

32. The message system of claim 9, wherein the message sourcing center maintains a billing information log for holding a set of billing parameters for the message.

33. The message system of claim 32, wherein the billing parameters include the indication of geographical location.

34. The message system of claim 32, wherein the billing parameters include the timing parameter.

35. A message delivery device, comprising:

message rendering device;

locating device for determining an indication of geographical location of the message rendering device;

means for storing a set of selection o generation parameters for each of a set of predefined or generated messages;

means for selecting a message for the message rendering device from among the predefined or generated messages by comparing the indication of geographical location and a timing parameter to the message selection or generation parameters.

36. The message delivery device of claim 35, wherein the message rendering device comprises a device for rendering a visual message.

37. The message delivery device of claim 35, wherein the message rendering device comprises a device for rendering an audio message.

38. The message device of claim 35, wherein the selection parameters for each predefined or generated message include a set of geographical parameters for delivering the corresponding predefined or generated message.

39. The message delivery device of claim 35, wherein the selection or generation parameters for each predefined message include a set of timing parameters for delivering the corresponding predefined or generated message.

40. A message system, comprising:

message sourcing center that transmits a set of message selection generation parameters and a message identifier for each of a set of predefined or generated messages;

at least one message delivery device each having a message rendering device and a locating device for determining an indication of geographical location of the message delivery device, each message delivery device having means for storing the predefined or generating messages and means for selecting or generating a message for the message rendering device from among the predefined or generated messages by comparing the indication of geographical location and a timing parameter to the message selection or generation parameters.

41. The message system of claim 40, wherein the message rendering device comprises a device for rendering a visual message.

42. The message system of claim 40, wherein the message rendering device comprises a device for rendering an audio message.

43. The message system of claim 40, wherein the selection or generation parameters for each predefined or generated message include a set of geographical parameters for delivering the corresponding predefined or generated message.

44. The message system of claim 40, wherein the selection or generation parameters for each predefined or generated message include a set of timing parameters for delivering the corresponding predefined or generated message.

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